

THE MINERAL INDUSTRY OF

ZAMBIA

By George J. Coakley

Zambia is a landlocked country in southern African with an area of 753,000 square kilometers, 9.6 million people, and a per capita gross domestic product (GDP) based on 1999 purchasing power parity estimates of \$880.¹ Overall, mining and quarrying accounted for about 5% of real GDP, 80% of merchandise exports, and about 38,500 jobs, or about 8% of total employment (Zambia Investment Center, April 19, 1999, Zambia—Country profile, accessed February 12, 2000, at URL <http://www.zic.org.zm/profile.htm>). Total merchandise exports in 1999 were approximately \$900 million. Petroleum products and mining equipment were the major components of more than \$1.1 billion in merchandise imports. The mining sector was dominated by copper and cobalt production. Zambia ranked as the world's 3d largest producer of cobalt, 12th in copper, and as one of the top producers of gem-quality emeralds in 1999. Besides copper and cobalt, Zambia produced a wide variety of metallic and industrial mineral commodities, as well as coal (table 1).

Between 1997 and late 1999, the Zambian Privatization Agency (ZPA) had been successful in privatizing most of its state-owned mining assets, with the exception of the two largest producing divisions of Zambian Consolidated Copper Company Limited (ZCCM)—Nchanga and Nkana. Originally packaged together under Privatization Package "A," ZPA agreed to break up the sale of Nchanga and Nkana assets into separate components. In December, a consortium comprised of First Quantum Minerals Ltd. of Canada and Glencore International AG of Switzerland won its bid to ZPA to acquire ZCCM's Mufalira Division, which included mines, concentrator, smelter and refinery, and selected Nkana Division assets which included the mining operation, the concentrator and the cobalt plant (First Quantum Minerals Ltd., 1999). When the sale is finalized in 2000, the First Quantum/Glencore consortium will have a 90% interest in the new operating company, Mopani Copper Mines Plc.; ZCCM will retain a 10% interest.

In October 1999, Zambia Copper Investments Ltd. (ZCI), which was owned by Anglo American plc signed a Heads of Agreement with ZCCM to acquire the Konkola and the Nchanga Divisions. The agreement was finalized in March 2000, with the announcement that the new Anglo American company Konkola Copper Mines plc (KCM) will acquire the Konkola Division, which included the Konkola Deep Mining Project; the Nchanga Division, which included the Chingola refractory ore stockpiles; the Nampundwe pyrite mine; and associated infrastructure, which included the Konkola, Nampundwe and Nchanga concentrators and the Nchanga tailings leach plant. KCM will be owned by Anglo American (65%), ZCCM (20%), International Finance Corp. (7.5%), and

Commonwealth Development Corp. Financial Services (7.5%). KCM agreed to pay ZCCM \$90 million in acquisition payments plus a copper and cobalt price participation bonus scheme to be capped at \$16 million per year and \$125 million over the life of the scheme. In addition, KCM committed to capital expenditures of \$260 million to rehabilitate the operations and, subject to financing and favorable copper markets, to develop the Konkola Deep Project at an estimated cost of \$523 million. In a parallel transaction, ZCI sold its 27.3% interest in ZCCM to the Government for \$30 million. KCM also had an option to buy the Nkana copper smelter (Anglo American plc, 1999, 2000). Details of the structure of the newly privatized mining industry are shown in table 2. For more extensive coverage of the mineral industry of Zambia, see the 1997 and 1998 Minerals Yearbook, volume III, Mineral Industries of Africa and the Middle East.

References Cited

- Anglo American plc, 1999, ZCCM agreements signed today: Anglo American plc press release, December 15, 1 p.
———2000, Privatisation of Zambian copper mines completed: Anglo American plc press release, March 31, 2 p.
First Quantum Minerals Ltd., 1999, First Quantum and Glencore consortium in negotiations to acquire Zambia Consolidated Copper Mines Mufalira Division and Nkana Division: First Quantum Minerals Ltd. press release, December 20, 1 p.

Major Sources of Information

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¹Where necessary, values have been converted from Zambian kwacha (K) to U.S. dollars at the rate of K2,388=US\$1.00 for 1999 and K1,862=US\$1.00 for 1998.

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Investment Opportunities in the Mineral Sector of Zambia,
Ministry of Mines and Mineral Development, Lusaka,
Zambia, 1998, 4 p.

TABLE 1
ZAMBIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1995	1996	1997	1998	1999 e/
METALS					
Beryllium, beryl e/ kilograms	1,000	1,000	800	800	800
Cobalt: 3/					
Mine output, Co content	5,908	6,959	6,037	11,900	5,640
Metal, Co content	2,934	4,611	4,386	5,011	4,236 4/
Copper: 3/ 5/					
Mine output, Cu content:					
By concentration or cementation	254,000	276,000	288,900	258,000 r/	203,000 4/
Leaching (electrowon)	62,000	58,000	64,000	57,000 r/	57,000 4/
Total	316,000	334,000	352,900	315,000 r/	260,000 4/
Metal:					
Smelter, primary:					
Electrowon (low grade)	65,400	73,900	61,140	51,736	25,000 4/
Other	234,500	250,300	220,327	206,871	184,000 4/
Total	299,900	324,200	281,467	258,607	209,000 4/
Refinery, primary:					
Electrowon	62,000	58,000	63,736	80,709	57,000 4/
Other	266,000	276,000	268,553	248,820	176,300 4/
Total	328,000	334,000	338,400	240,500	233,300 4/
Gold 3/ kilograms	91	119	290 e/	765	700
Selenium, refined, gross weight 3/ do.	18,550	20,016	15,161	14,670	10,170
Silver 3/ do.	8,676	9,410	6,684	8,363	5,110
INDUSTRIAL MINERALS					
Cement, hydraulic e/	312,000 4/	348,000 4/	384,000 4/	351,000	300,000
Clays:					
Brick e/	3,000	3,000	3,000	3,000	3,000
Building, not further specified e/	30,000	30,000	30,000	30,000	30,000
China and ball e/	200	200	200	200	200
Gemstones: e/					
Amethyst kilograms	350,000	1,198,354	699,343	800,000	800,000
Aquamarine do.	200	866	--	--	--
Beryl do.	2,000	4,544	1,527	2,000	2,000
Emerald do.	180	6,000	7,000	7,000	7,000
Garnet do.	5,000	13,701	2,467	3,000	3,000
Tourmaline do.	2,000	4,150	--	--	--
Gypsum e/	11,000	11,000	11,000	11,000	11,000
Lime, calcined e/ thousand tons	200	200	200	200	200
Limestone (cement and lime) e/ do.	800	800	800	800	800
Magnetite, gross weight e/	1,000	1,000	1,000	1,000	1,000
Nitrogen, N content of ammonia e/	3,000	3,000	3,000	3,000	3,000
Sand and gravel, construction e/ thousand tons	200	200	200	200	200
Stone, construction:					
Limestone, crushed aggregate e/ do.	700	700	700	700	700
Other e/ do.	700	700	700	700	700
Sulfur: 3/					
Pyrite concentrate:					
Gross weight	69,228	78,971	69,059	72,366	65,000
S content (42%) e/	28,314 5/	33,200	29,005	30,394	27,300
Sulfuric acid: 6/					
Gross weight	218,252	206,572	178,482	134,000	119,000
S content (32.6%)	71,150	67,340	58,185	43,684	38,800
Total, S content	99,464	100,540	87,190	74,078	66,100
Talc e/	80	80	80	80	80
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous e/ thousand tons	141	100	10	50	100
Petroleum, refinery products e/ 2/ thousand 42-gallon barrels	5,000	5,000	5,000	5,000	5,000

e/ Estimated. r/ Revised. -- Zero.

1/ Estimated data are rounded to no more than three significant digits: may not add to totals shown.

2/ Table includes data available through October 15, 2000.

3/ Data are for year beginning April 1 of year stated.

4/ Terms are used as defined by the International Copper Study Group.

5/ Reported figure.

6/ From ZCCM Chambishi and Nkana acid recovery plants.

TABLE 2
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY 1/

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Chilanga Cement plc (Commonwealth Development Corp., 50.1%; General public, 30.2%; Anglo American plc, 16.7%; Civil Service Penisons Board, 6.5%)	Lusaka Plant	200,000.
		Ndola Plant	290,000.
Coal	Maamba Collieries Ltd.[Benicon Ltd. (South Africa), 80%, Zambian Governmnet, 20%].	350 kilometers south of Lusaka in Kanzie and Izuma basins	800,000 bituminous coal operating at 300 K to 400 K.
Copper-cobalt	Konkola Copper Mines plc (Anglo American plc, 65%; ZCCM, 20%, International Finance Corp., 7.5%; Commonwealth Development Corp., 7.5%) (as of April 2000)	Nchanga and Chingola Open Pits	4,500,000 ore.
Do.	do.	Nchanga Underground Mine	2,800,000 ore.
Do.	do.	Nchanga Concentrator	88,000 copper in concentrate. 10,000 cobalt in concentrate.
Do.	do.	Nchanga Tailings Leach Plant	70,000 leach cathodes.
Do.	do.	Konkola underground mine	2,200,000 ore.
Do.	do.	Konkola Concentrator	50,000 copper in concentrate.
Do.	do.	Konkola Deep Mining Project	(180,000 copper planned).
Do.	do. (KCM has option to buy)	Nkana Copper Smelter	450,000 blister/anode.
Do.	do. (KCM has option to buy)	Nkana Copper Refinery	236,000 blister/anode.
Do.	Mopani Copper Mines plc (90%); ZCCM, (10%) [Mopani owned by Glencore International Ag (Switzerland), 51%; First Quantum Minerals Ltd. (Canada), 49%] (as of April 2000)	Mufalira Mine	2,800,000 ore.
Do.	do.	Mufalira Concentrator	63,000 copper in concentrate.
Do.	do.	Mufalira Smelter	130,000 copper.
Do.	do.	Mufalira Refinery	150,000 copper.
Do.	do.	Nkana Mine	3,000,000 ore.
Do.	do.	Nkana Concentrator	45,000 copper in concentrate. 1,900 cobalt in concentrate.
Do.	do.	Nkana Cobalt Plant	3,000 cobalt, refined, 15,000 copper.
Do.	Anglovaal Minerals Ltd. (Avmin) (South Africa), 80%; ZCCM, 20%).	Konkola North Project (exploration and feasibility studies)	
Do.	Chambishi Metals plc, (Avmin, 90%, ZCCM, 10%)	Chambishi Cobalt Plant	4,000 cobalt.
Do.	do.	Nkana Slag Dump (plant upgrade by 2001)	7,000 copper.
Do.	do.	UCHI tails retreatment plant	7,000,000 metric tons per year tailings feed.
Do.	First Quantum Minerals Ltd. (Canada), 100%.	Bwana Mkubwa Mine; SX-EW plant (tailings retreatment operation)	10,000 copper cathode.
Do.	Chibuluma Mines plc (Metorex Ltd., 85%; ZCCM, 15%)	Chibuluma West Mine (to close by 2003 or 2004)	450,000 ore, 8,400 contained copper, 100 contained cobalt.
Do.	do.	Chibuluma South Mine Project (to open by 2003 or 2004)	(18,000 copper planned).
Do.	Roan Antelope Mining Corp. [Binani Group (India) 85%, ZCCM, 15%]	Luanshya underground mine	1,700,000 ore.
Do.	do.	Luanshya Concentrator	23,000 copper in concentrate.
Do.	do.	Baluba underground mine	1,400,000 ore.
Do.	do.	Baluba Concentrator	24,000 copper in concentrate, 1,900 cobalt in concentrate.
Do.	do.	Luanshya Smelter (closed)	20,000.
Do.	do.	Mulashi North Project (planned)	34,000 copper;1,400 cobalt.
Do.	NFC Africa Mining plc (China Non-Ferrous Metals Industries, 85%; ZCCM, 15%).	Chambishi Mine (closed in 1987)	(45,000 copper planned) reopen in late 2002.
Do.	Cyprus Amax Kansanshi plc (United States), 80%; ZCCM, 20%.	Kansanshi Mine and environs. Mine closed, 1998; exploration continuing	
Do.	Lumwana Joint Venture (Phelps Dodge Corp. (United States), 100%; Equinox Resources NL (Australia), can earn-in 50% to 75% interest.	Lumwana deposit (exploration and prefeasibility work)	(75,000 copper potential).
Do.	Qasim Mining Enterprises Ltd., (Colossal Resources Corp. of Vancouver, Canada, 60%).	Kabwe cobalt tails retreatment plant (closed in 1998)	600 cobalt.

See footnotes at end of table.

TABLE 2--Continued
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY 1/

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper-cobalt--Continued		Orion Mining Zambia	Kabwe slag processing plant to treat feed imported from Congo (Kinshasa)	60,000 metric tons per year slag yielding 1,800 to 5,000 metric tons per year cobalt.
<i>Gemstones: e/</i>				
Amethyst	kilograms	Vantage Enterprises Corp. (Canada); various artisanal operations.	Krystal Mine in Kaloma; Mumbwa; near Zimbabwe border	NA.
Aquamarine	do.	Various artisanal operations.	Katete, Petauke areas	NA.
Beryl	do.	do.	Eastern Province pegmatites	NA.
Citrine	do.	do.	Iteshi Teshi; Mumbwa.	NA.
Emeralds	do.	30 to 40 artisanal operations	Northwest of Kitwe.	600.
Garnet	do.	Various artisanal operations.	Eastern Province pegmatites, Mazabuka Siavunga, Chikankata, Gwemba Valley	NA.
Tourmaline	do.	do.	Kalunga Wbeba Mine, Eastern Province Hofmeyer Mine near Nyimba	NA.
Gold	do.	Reunion Mining plc, (Anglo American plc, 100%)	Dunrobin Mine, 120 kilometers west of Lusaka	600.
Do.	do.	Minerva (PMP) Ltd. [Binani Group (India), 100%] (processes copper refinery slimes).	Ndola Precious Metals Plant	150 refined gold.
Lime		Ndola Lime Co. Ltd., (ZCCM, 100%)	Ndola plants kiln capacity	1,000 metric tons per day limestone feed, 300,000 quicklime product.
Petroleum	42-gallon barrels	Zambia National Oil Co.	Indeni refinery at Ndola (damaged by fire in 1999).	8,950,000 refined products.
Selenium	kilograms	do.	Ndola Precious Metals Plant	22,000 refined selenium.
Silver	do.	do.	do.	10,000 refined silver.
Sulfur 2/		Konkoo Copper Mines plc (Ownership, see above)	Nampundwe Pyrite Mine	79,000 pyrite, 33,000 contained sulfur.
Do.		Chambishi Metals plc, (Avmin, 90%, ZCCM, 10%)	Chambishi Acid Plant	65,000 sulfuric acid, 21,190 contained sulfur.
Do.		Mopani Copper Mines plc (Ownership, see above)	Nkana Acid Plant	120,000 sulfuric acid, 39,120 contained sulfur.
Do.		First Quantum Minerals Ltd. (Canada)	Bwana Mkubwa Acid Plant	110,000 sulfuric acid, 35,860 contained sulfur.

NA Not available.

1/ Includes data available through June 30, 2000